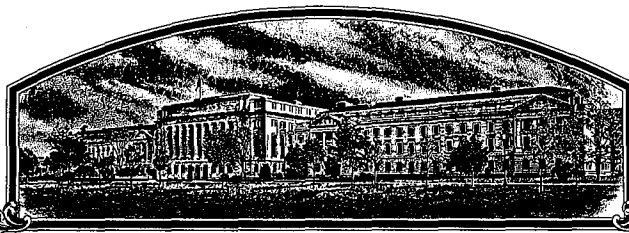


No.



9600094

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Abbott & Cobb, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED, PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED BY 7 U.S.C. 2321 ET SEQ.)

CORN, SWEET (F1)

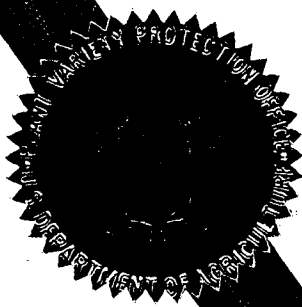
'#781 Ultra'

*Original grant December 31, 1997

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this thirtieth day of June in the year of our Lord one thousand nine hundred and ninety-nine.

Attest:

Acting Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture


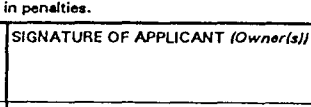
U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE DIVISION - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a).

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate)		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER		3. VARIETY NAME	
Abbott & Cobb, Inc.		ACX 94 CN 06		#781 ultra JM 2/1	
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)		5. TELEPHONE (include area code)		FOR OFFICIAL USE ONLY PVPO NUMBER 9600094	
4151 Street Road P. O. Box 307 Feasterville, PA 19053-0307		215-245-6666			
6. FAX (include area code)		7. GENUS AND SPECIES NAME		FILING DATE	
215-245-1068		Zea mays L.		12/28/95	
8. FAMILY NAME (Botanical)		9. CROP KIND NAME (Common name)		FILING AND EXAMINATION FEE	
Graminae		Sweet Corn		2450.00	
10. IF THE APPLICANT NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) (Common name)		11. IF INCORPORATED, GIVE STATE OF INCORPORATION		DATE	
Corporation		Abbott & Cobb, Inc. PA		12/28/95	
12. DATE OF INCORPORATION		13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS		CERTIFICATION FEE	
1/1/74		Bryant Long Abbott & Cobb, Inc. 11460 Fortune Circle West Palm Beach, FL 33414		300.00	
14. TELEPHONE (include area code)		15. FAX (include area code)		DATE	
312-443-0497		312-443-0336		Dec 8, 1997	
16. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)					
a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of the Variety d. <input type="checkbox"/> Exhibit D. Additional Description of the Variety e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Applicant's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,600 viable untreated seeds or, for tuber propagated varieties verification that tissue culture will be deposited and maintained in a public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,450), made payable to "Treasurer of the United States" (Mail to PVPO)					
17. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY, AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act)?					
<input type="checkbox"/> YES (If "yes," answer items 18 and 19 below) <input checked="" type="checkbox"/> NO (If "no," go to item 20)					
18. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?			19. IF "YES" TO ITEM 18, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?		
<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			<input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED		
20. HAS THE VARIETY OR A HYBRID PRODUCED FROM THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES?					
<input checked="" type="checkbox"/> YES (If "yes," give names of countries and dates) <input type="checkbox"/> NO					
U.S.A. January 15, 1995 JM 8/21/9					
21. The applicant(s) declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.					
The undersigned applicant(s) is(are) the owner(s) of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.					
Applicant(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.					
SIGNATURE OF APPLICANT (Owner(s))			SIGNATURE OF APPLICANT (Owner(s))		
					
NAME (Please print or type)			NAME (Please print or type)		
Abbott & Cobb, Inc.			Abbott & Cobb, Inc.		
CAPACITY OR TITLE		DATE	CAPACITY OR TITLE		DATE
Chief Executive Officer		12/26/95			

9600094

ORIGIN AND BREEDING HISTORY OF THE VARIETY

TO ASSEMBLE COMPONENTS OF SU 1 (SUGARY), SE (SUGARY ENHANCER), AND SH 2 (SHRUNKEN 2) INTO A SINGLE BACKGROUND A NUMBER OF BREEDING TECHNIQUES WERE UTILIZED.

SE IS CONSIDERED TO BE CONDITIONED BY A SINGLE GENE WITH SEVERAL MODIFIERS REQUIRED FOR FULL EXPRESSION (FERGUSON, J.E., RHODES, A. M. AND DICKINSON, D. B. 1978. J. HERED. 69:377-380).

SIMILARLY SU 1 AND SH 2 ARE CONDITIONED BY SINGLE GENES, RESPECTIVELY. HOWEVER, DESIRABLE HIGH LEVEL QUALITY ATTRIBUTES ARE AGAIN CONDITIONED BY NUMEROUS MODIFIER GENES (TRACY, F. T. IN PRESS. THE DEVELOPMENT, GENETICS, AND BREEDING OF SUPERSWEET (SHRUNKEN 2) SWEET CORN. PLANT BREEDING REVIEWS).

WITH ALL THREE ENDOSPERM TYPES, GENETIC BACKGROUND HAS BEEN DEMONSTRATED TO PLAY A SIGNIFICANT ROLE.

THE INITIAL STEP TO INCORPORATE ALL THREE GENES INVOLVED SELECTING THE MOST HIGH QUALITY AND COMMERCIALY DESIRABLE SH 2 PARENTAL LINES FROM THE ABBOTT AND COBB GERMPLASM BANK. THIS RESULTED IN THE SELECTION OF 26 LINES. SIMILARLY, A NUMBER OF SE SOURCES WERE UTILIZED AS WELL:

- IL 677A SE INBRED RELEASED BY DR. A.M. RHODES (UNIVERSITY OF ILLINOIS).
- EIGHT COMMERCIAL HOMOZYGOUS SE INBRED LINES FROM THE ABBOTT AND COBB GERMPLASM BANK SELECTED ON THE BASIS OF HIGH QUALITY AND COMMERCIAL APPLICATION.

SU 1 GENETIC MATERIALS WERE CHOSEN BASED UPON THE MOST HORTICULTURALLY DESIRABLE, HIGH QUALITY, COMMERCIAL ATTRIBUTES. THESE MATERIALS WERE COMPRISED OF THE HYBRIDS SILVER QUEEN (ROGERS), JUBILEE (ROGERS), BONANZA (FERRY MORSE), AND BELLRINGER (HARRIS MORAN).

IN ESSENCE, ALL 26 SH 2 INBRED LINES WERE INDIVIDUALLY CROSSED (SEPARATELY) TO THE NINE INDIVIDUAL SE SOURCE MATERIALS. THE RESULTANT 234 SINGLE CROSSES WERE



EXHIBIT 16A(REVISED)

IN TURN CROSSED TO THE FOUR SU 1 SOURCE HYBRIDS. THIS COMPLETED THE CONSTRUCTION OF 936 F1 PEDIGREES. ALL 936 F1 PEDIGREES WERE SELF POLLINATED AND ADVANCED TO THE F2 GENERATION.

50 PLANTS OR MORE OF EACH F2 GENERATION PEDIGREE WERE GROWN, SELF POLLINATED AND SELECTED FOR SUPERIOR HORTICULTURAL CHARACTERISTICS.* TWELVE TO 18 EARS PER SAVED PEDIGREE WERE MASS SELECTED AND BULKED RESULTING IN 263 F3 FAMILIES.

** See Figure 17A for details of selection criteria*

APPROXIMATELY 50 OR MORE PLANTS WERE GROWN OF EACH F3 FAMILY FOR INITIAL ORGANOLEPTIC AND EVENTUAL QUANTITATIVE ENDOSPERM BIOCHEMICAL ANALYSIS. THIS RESULTED IN APPROXIMATELY 13,150 OR MORE TOTAL PLANTS.

AT PRIME EATING STAGE A SWEET CORN COBB CUTTER WAS UTILIZED TO REMOVE AN APPROXIMATE ONE THIRD TO ONE HALF OF THE EAR FOR ORGANOLEPTIC TASTE EVALUATION. THE REMAINING PORTION OF THE EAR STILL ATTACHED TO THE PLANT WAS TAGGED AND CONSIDERED FOR POTENTIAL CONSERVATION OF THE GENETIC MATERIAL UNDER EVALUATION.

CRITICAL CRITERIA WERE ENFORCED TO ELIMINATE THOSE PLANTS AND THEREFORE EARS NOT EXPRESSING THE DESIRED HIGHLY SPECIFIC AND RECOGNIZABLE ASSOCIATION OF HIGH SUGAR, TENDERNESS, FLAVOR AN CREAMY TEXTURE REQUIREMENTS.

THIS INITIAL EVALUATION RESULTED IN 312 PLANTS TAGGED AND KEPT SEPARATE COMPRISING 146 OF THE 263 FAMILIES TESTED.

FROM THESE SAME 312 EARS BIOCHEMICAL LABORATORY ASSAYS FOR CONFIRMATION OF SUGAR LEVELS (SUCROSE, GLUCOSE, AND FRUCTOSE) AND ASSOCIATED PERICARP DETERMINATIONS WERE ENACTED.

BASED UPON THE COMBINED ORGANOLEPTIC AND BIOCHEMICAL ASSAYS A FURTHER REDUCTION TO 197 EARS WAS MADE. THIS REDUCTION RESULTED IN THE 197 EARS BEING COMPRISED FROM 112 OF THE 263 INITIAL F3 FAMILIES TESTED.

SIMILAR ORGANOLEPTIC AND LABORATORY PROCEDURES WERE UTILIZED IN THE SUBSEQUENT FOUR SELF POLLINATED GENERATIONS.



EXHIBIT 16A(REVISED)

JMS
8/21/97

SELF POLLINATION OF EACH LINE WAS CONTINUED FOR TWO ADDITIONAL GENERATIONS IN WHICH STRICTLY HORTICULTURAL CHARACTERISTICS^{*} WERE MONITORED AND UNIFORMITY AND RELATED TRAITS REFINED. * See Figure 17A for details of selection criteria

THIS FINAL SIX GENERATIONS OF INBREEDING AND SELECTION RESULTED IN 14 INDIVIDUAL EARS AND PEDIGREES WITH SUPERIOR LEVELS OF SUGAR, TENDERNESS, TEXTURE, AND FLAVOR.

A DIALLEL CROSSING BLOCK WAS CONSTRUCTED FOR THE 14 REMAINING PEDIGREES TO CONSTRUCT A SERIES OF F1 HYBRIDS.

THE RESULTANT HYBRID ACX 94 CN 06 WAS CHOSEN ON THE BASIS OF DESIRABLE EATING QUALITY COMPONENTS AS WELL AS FAVORABLE HORTICULTURAL CHARACTERISTICS.

A SCHEMATIC DIAGRAM OUTLINING THE DERIVATION OF ACX 94 CN06 IS GIVEN IN FIG. 17.

SUPPLEMENTARY EXHIBIT A: (A) SH2 LINES

PERMANENT AC LINE DESIGNATIONS

<u>SUCCESSION NUMBER</u>	<u>PERMANENT LINE DESIGNATION</u>
AC SH2 01	FLORIDA STAYSWEET. 1114
AC SH2 02	FLORIDA STAYSWEET. 8714
AC SH2 03	FLORIDA STAYSWEET. 4213
AC SH2 04	FLORIDA STAYSWEET. 7111
AC SH2 05	FLORIDA STAYSWEET. 7133
AC SH2 06	FLORIDA STAYSWEET. 0062
AC SH2 07	FLORIDA STAYSWEET. 1368
AC SH2 08	FLORIDA STAYSWEET. 1299
AC SH2 09	FLORIDA STAYSWEET. 1131
AC SH2 10	FLORIDA STAYSWEET. 4368
AC SH2 11	FLORIDA STAYSWEET. 9327
AC SH2 12	FLORIDA STAYSWEET. 1665
AC SH2 13	FLORIDA STAYSWEET. 9375
AC SH2 14	FLORIDA STAYSWEET. 6451
AC SH2 15	FLORIDA STAYSWEET. 3869
AC SH2 16	FLORIDA STAYSWEET. 9749
AC SH2 17	FLORIDA STAYSWEET. 6649
AC SH2 18	FLORIDA STAYSWEET. 4023
AC SH2 19	FLORIDA STAYSWEET. 1420
AC SH2 20	FLORIDA STAYSWEET. 1693
AC SH2 21	FLORIDA STAYSWEET. 3056
AC SH2 22	FLORIDA STAYSWEET. 4860
AC SH2 23	FLORIDA STAYSWEET. 2736
AC SH2 24	FLORIDA STAYSWEET. 4861
AC SH2 25	FLORIDA STAYSWEET. 4936
AC SH2 26	FLORIDA STAYSWEET. 5529

SUPPLEMENTARY EXHIBIT A: (B) SE LINES

PERMANENT AC LINE DESIGNATIONS

<u>SUCCESSION NUMBER</u>	<u>PERMANENT LINE DESIGNATION</u>
AC SE 01	IL 677A. 3327
AC SE 02	IL 677A. 4859
AC SE 03	IL 677A. 1392
AC SE 04	IL 677A. 3825
AC SE 05	IL 677A. 7738
AC SE 06	IL 677A. 8294
AC SE 07	IL 677A. 2584
AC SE 08	IL 677A. 3759

SUPPLEMENTARY EXHIBIT A: (C)

THE HYBRID ACX94 CN06 HAS BEEN OBSERVED TO BE UNIFORM, STABLE, AND FREE OF VARIANTS AND OFFTYPES. HYBRID ACX94 CN06 HAS BEEN OBSERVED NUMEROUS GENERATIONS SINCE 1994.

<u>YEAR</u>	<u>GENERATIONS OF STABILITY</u>
1994	4
1995	5
1996	5
1997 (GROW OUT IN PROGRESS)	-
TOTAL	14



EXHIBIT 16A(REVISED)

JMS
8/1/97

RESPONSE TO EXAMINATION CHECKLIST ITEM (10), SELECTION CRITERIA

FIGURE 17A

- A) SEEDLING GERMINATION - PERCENTAGE OF SEED THAT GERMINATED
- B) SEEDLING VIGOR - RATING SCALE WHEREBY 1=WORST, 5= BEST. DENOTES STRENGTH AND OVERALL SEEDLING GROWTH.
- C) PLANT HEIGHT - DESIRABLE HEIGHT = 5 TO 7½ FEET TO FACILITATE MANUAL AND MECHANICAL HARVEST
- D) PLANT COLOR - RATING SCALE WHEREBY 1= LIGHT GREEN, 5 = DARK GREEN (MEDIUM TO DARK GREEN IS CONSIDERED BEST)
- E) HUSK COLOR - RATING SCALE WHEREBY 1 = LIGHT GREEN, 5 = DARK GREEN (MEDIUM TO DARK GREEN HUSK COLOR IS CONSIDERED DESIRABLE)
- F) HUSK LENGTH - MEASURED IN INCHES (LENGTH OF HUSK EXTENDING FROM THE END OF THE EAR)
- G) HUSK TIGHTNESS - RATING SCALE WHEREBY 1 = LOOSE, 5 = VERY TIGHT
- H) EAR HEIGHT - MEASURED IN INCHES (22-34 INCHES TO ASSIST IN MANUAL AND MECHANICAL HARVESTING)
- I) EASE OF EAR REMOVAL - RATING SCALE WHEREBY 1 = VERY HARD REMOVAL BY HAND, 5 = EASY EAR REMOVAL BY HAND)
- J) EAR LENGTH - MEASURED IN INCHES (7½ TO 8½ INCHES IS DESIRABLE)
- K) EAR DIAMETER - MEASURED IN INCHES (1¼ TO 1.875 INCHES IS DESIRABLE)
- L) ROW COUNT - NUMBER OF KERNEL ROWS (14-20 ROWS ACCEPTABLE)
- M) KERNEL ROW STRAIGHTNESS - RATING SCALE WHEREBY 1 = IRREGULAR ROWING, 5 = EVEN, STRAIGHT ROWS)
- N) PERICARP - MEASURE OF EATING QUALITY BASED UPON A RATING SCALE WHEREBY 1 = VERY THICK, CHEWY KERNEL EXTERNAL TEXTURE, 5 = VERY THIN, SOFT TEXTURE
- O) SWEETNESS - TASTE TEST MEASURE OF OVERALL SWEETNESS - RATING SCALE WHEREBY 1 = MINIMUM SWEETNESS, 5 = VERY SWEET
- P) TEXTURE - MEASURE OF INTERIOR KERNEL TEXTURE - RATING SCALE WHEREBY 1 = WATERY INTERNAL TEXTURE, 5 = CREAMY INTERNAL TEXTURE

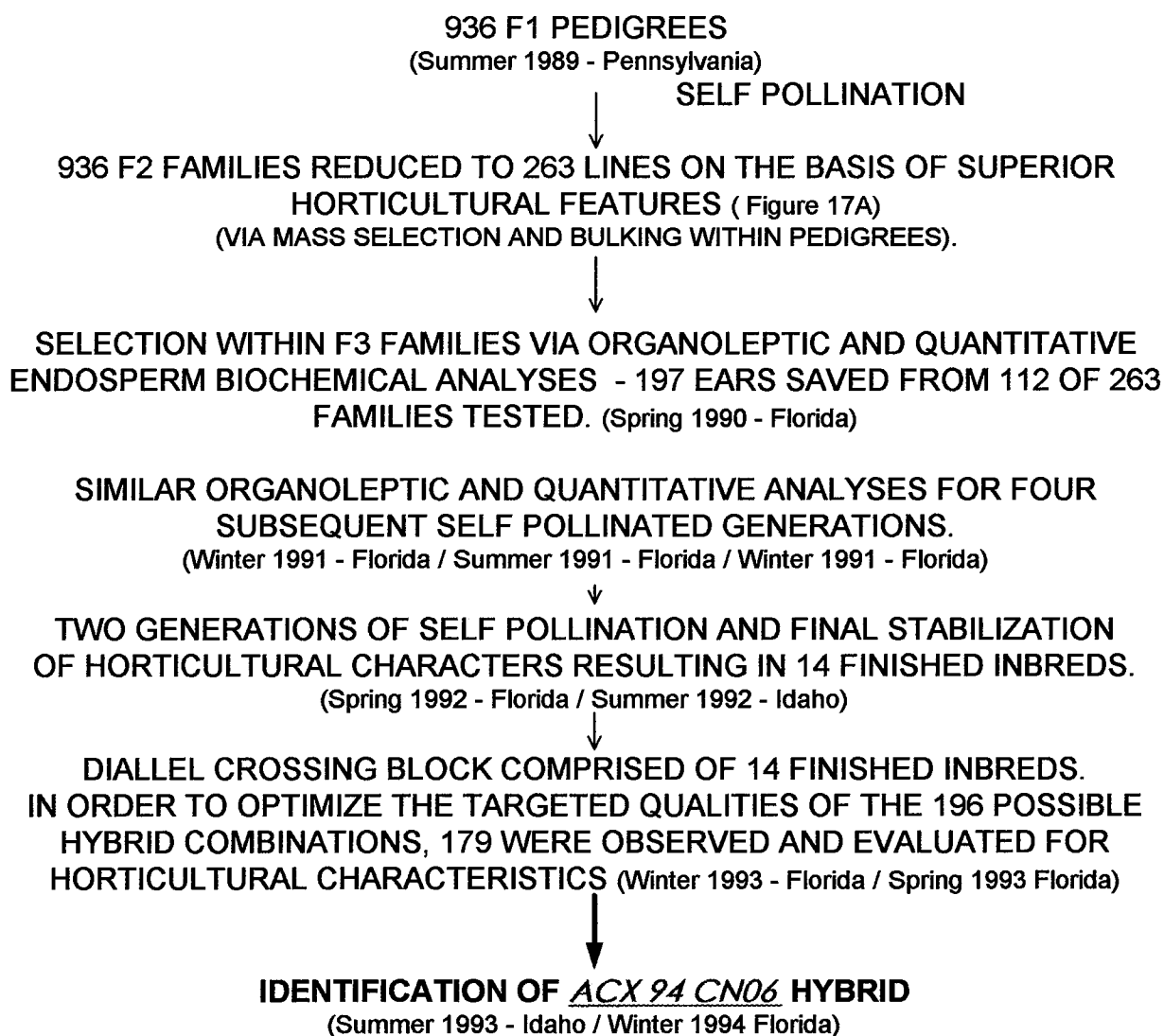


EXHIBIT 16A(REVISED)

FIGURE 17 AND SUPPLEMENTAL EXHIBIT 17A

BREEDING HISTORY AND ORIGIN OF ACX 94 CNO6

FLORIDA STAYSWEET	IL 677A	SILVER QUEEN
AC SH2 01	AC SE 01	JUBILEE
X	X	BONANZA
AC SH2 26	AC SE 08	BELLRINGER



♀ ACϕ4 X ♂ ACϕ3 were the parent inbred lines

**EXHIBIT 16B (REVISED)**

THE REQUESTED COMPARISON VARIETY IS SILVER QUEEN BY ROGERS SEED CO. (SEE ENCLOSED CATALOG DESCRIPTIONS) LISTED IN EXHIBIT "C". SILVER QUEEN IS THE MOST SIMILAR VARIETY.



EXHIBIT 16B (REVISED)

STATEMENT OF DISTINCTNESS

THE ENDOSPERM IS A MAJOR LOCATION IN WHICH STARCH DEPOSITION OCCURS DURING KERNEL DEVELOPMENT.

THERE ARE CERTAIN GENES THAT HAVE BEEN BIOCHEMICALLY CHARACTERIZED THAT AFFECT SPECIFIC CARBOHYDRATE METABOLISM.

IN SWEET CORN THREE SUCH GENETIC ELEMENTS MOST WIDELY USED COMMERCIALY ARE THE SU 1 (SUGARY -1), SE (SUGARY ENHANCER), AND SH 2 (SHRUNKEN - 2) GENES.

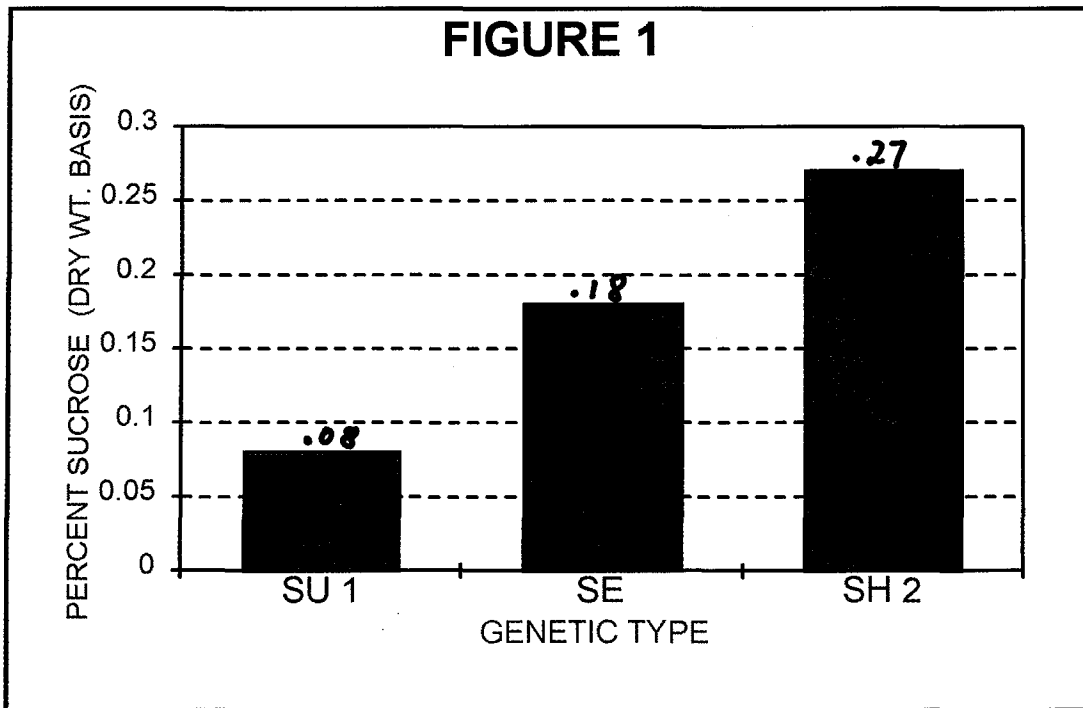
WHEN THE SU 1, SE, AND SH 2, GENES ARE EXPRESSED INDIVIDUALLY THERE IS A DRAMATIC DECREASE IN STARCH BIOSYNTHESIS LEADING TO ELEVATED SUGAR LEVELS IN THE ENDOSPERM.

THE SUGAR LEVELS IN SE AND SH 2 TYPES IN PARTICULAR TEND TO BE HIGHER INITIALLY AND REMAIN ELEVATED FOR MUCH LONGER TIME DURATION EXTENDING FRESH CONSUMPTION AND MARKETABILITY OF PRODUCTS (FIG. 1 AND 2) (TRACEY, W.F. 1994. P147-187. IN A.R. HALLAUER (ED.) *SPECIALTY CORNS*. CRC PRESS. BOCA RATON, FLORIDA).

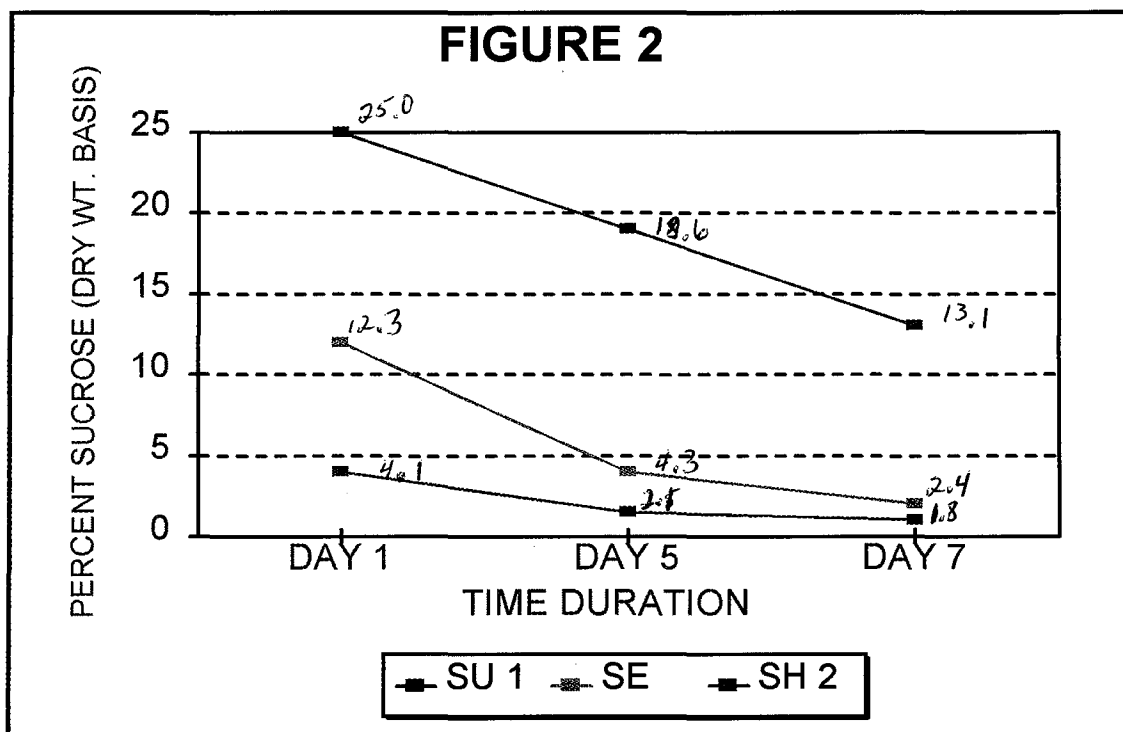
ADDITIONALLY, THE PERICARP SURROUNDING THE ENDOSPERM IN SU 1, SE, AND SH 2 TYPES IS ALTERED STRUCTURALLY AS WELL. IN THESE GENETIC LINES PERICARP LEVELS TEND TO BE REDUCED IN QUANTITY. THIS MORE TENDER CHARACTERISTIC IS A HIGHLY DESIRABLE CONSUMER ATTRIBUTE.

FIG. 3 AND 4 ILLUSTRATES THE RELATIONSHIP AT PRIME AND WITH SUBSEQUENT TIME INTERVALS FOR THE SU 1, SE, AND SH 2 GENETIC TYPES.

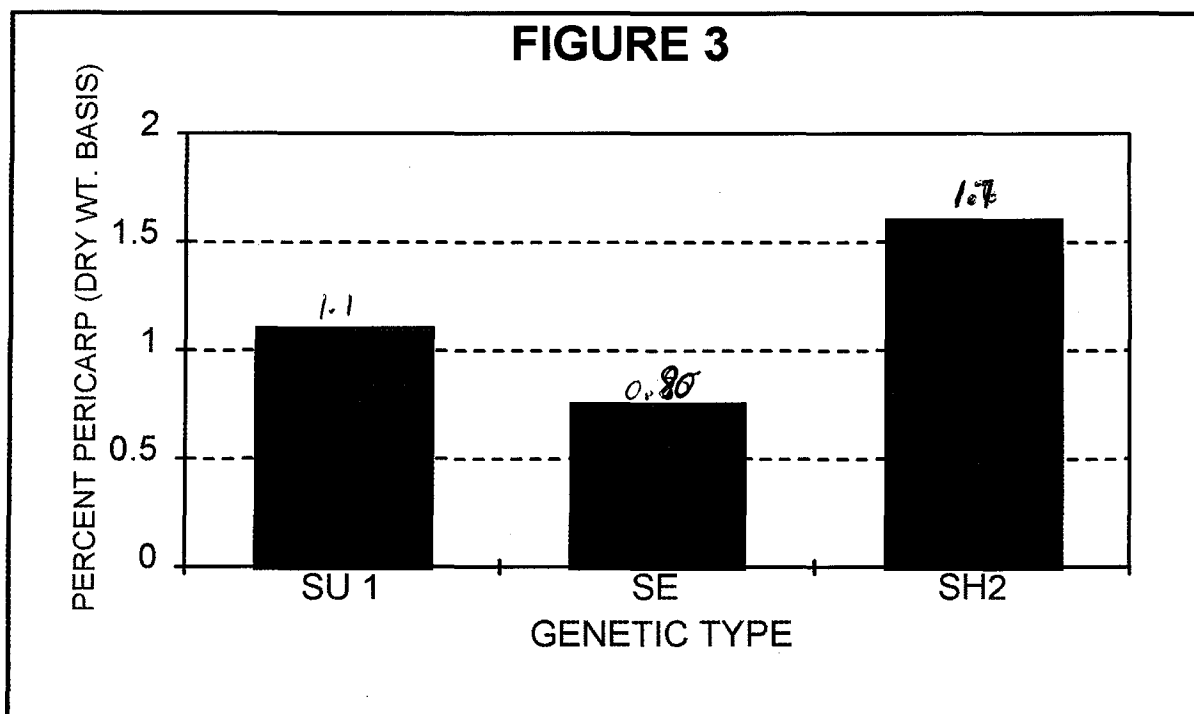
OTHER GENERALIZATIONS ARE THAT ALTHOUGH SU 1 SWEET CORN HYBRIDS ARE LOWER IN SUGAR LEVELS COMPARED TO SE AND SH 2 TYPES THEY ARE DESIRABLE IN TERMS OF ENDOSPERM TEXTURE AND FLAVOR COMPONENTS (AZANZA, F., KLEIN, B.P., AND JUVIK, J. IN PRESS. *SENSORY CHARACTERIZATION OF SWEET CORN LINES DIFFERING IN PHYSICAL AND CHEMICAL COMPOSITION*. JOURNAL OF FOOD SCIENCE).



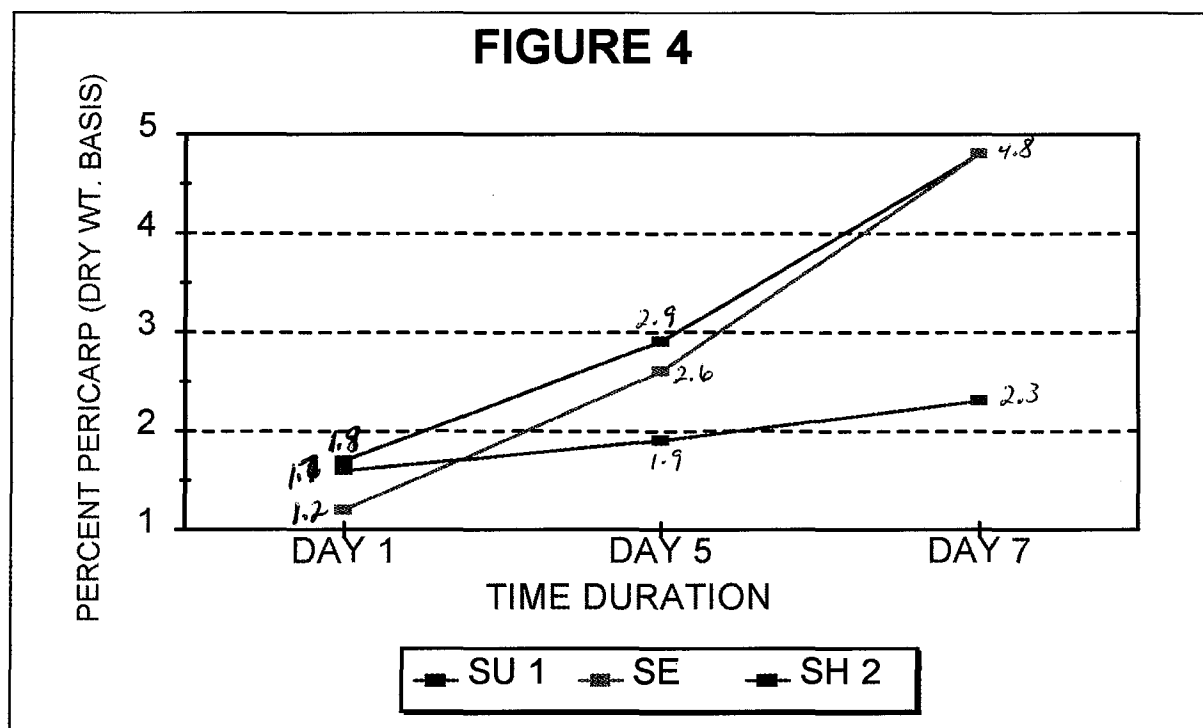
REPRESENTATIVE ENDOSPERM SUCROSE LEVELS IN SU 1, SE, AND SH 2 GENETIC LINES AT PRIME EATING STAGE (APPROXIMATELY 75 PERCENT MOISTURE)



REPRESENTATIVE CHANGES IN SUCROSE LEVELS OVER TIME FOR SU 1, SE, AND SH 2 GENETIC LINES (ROOM TEMPERATURE)



REPRESENTATIVE PERICARP LEVELS IN SU 1, SE, AND SH 2 GENETIC LINES AT PRIME EATING STAGE (APPROXIMATELY 75 PERCENT MOISTURE)



REPRESENTATIVE CHANGES IN PERICARP LEVELS OVER TIME IN SU 1, SE, AND SH 2 GENETIC LINES (ROOM TEMPERATURE)

**EXHIBIT 16B (REVISED)**

SE SWEET CORNS HYBRIDS ARE SIMILARLY CONSIDERED DESIRABLE FOR TEXTURE AND FLAVOR COMPONENTS BUT WITH THE ADVANTAGE OF INITIALLY ELEVATED SUGAR LEVELS.

SH 2 SWEET CORN HYBRIDS HAVE BEEN CONSIDERED SOMEWHAT LACKING IN FLAVOR AND TEXTURE COMPONENTS. HOWEVER, THE ADVANTAGE OF SIGNIFICANTLY HIGHER SUGAR LEVELS AND HOLDING ABILITIES HAVE MADE THIS CLASS THE MOST RAPIDLY GROWING FRESH MARKET AND SHIPPING PRODUCT CLASS.

THE UNIQUENESS OF ACX 94 CN06 RELATES TO THE ASSEMBLY AND STABILIZATION OF A GROUP OF GENETIC FACTORS CONDITIONING SUGAR CONCENTRATIONS, PERICARP LEVELS, TEXTURE, FLAVOR, AND RELATED DESIRABLE ENDOSPERM COMPONENTS.

IN THIS REGARD ACX 94 CN06 IS THE FIRST DOCUMENTED EXAMPLE WHERE POSITIVE COMPONENTS OF SU 1, SE, AND SH 2 GENETIC TYPES ARE COMBINED INTO ONE.

TO DETERMINE RELATIVE LEVELS OF VARIOUS ENDOSPERM COMPONENTS, QUANTITATIVE ANALYSES WERE PERFORMED ON A SELECTED NUMBER OF GENETIC TYPES (COMMERCIAL HYBRIDS).

REPRESENTATIVE COMMERCIALLY AVAILABLE VARIETIES BY ENDOSPERM TYPE ARE SHOWN IN TABLE 1.

TABLE 1.

SWEET CORN VARIETIES REPRESENTATIVE OF SU 1, SE, AND SH 2 GENETIC TYPES
COMPARED TO ACX 94 CN06.

<u>VARIETY</u>	<u>ENDOSPERM</u>	<u>SOURCE</u>
SILVER QUEEN	SU 1	ROGERS (NOVARTIS)
# 72 Y	SE	ABBOTT AND COBB
ULTIMATE	SH 2	HARRIS MORAN
CHALLENGER	SH 2	ASGROW
FLORIDA STAY SWEET	SH 2	ILL. FOUNDATION SEEDS
ACX 94 CN06	COMBINED	ABBOTT AND COBB



EXHIBIT 16B (REVISED)

SILVER QUEEN HAS BEEN PERCEIVED AS AN EXTREMELY HIGH QUALITY SU 1 SWEET CORN AND HAS FOR MANY YEARS BEEN THE LARGEST SELLING FRESH MARKET VARIETY IN ITS CLASS.

ULTIMATE, CHALLENGER, AND FLORIDA STAY SWEET ARE HIGHLY SUCCESSFUL AND WIDELY GROWN COMMERCIAL SH 2 VARIETIES. 72 Y IS A POPULAR AND HIGHLY REPRESENTATIVE HOMOZYGOUS SE COMMERCIAL VARIETY.

SUCROSE, FRUCTOSE, AND GLUCOSE LEVELS WERE DETERMINED UTILIZING A YSI MODEL 2700 BIOCHEMISTRY ANALYZER.

THE PROCEDURE ENTAILS HOMOGENIZATION OF 10 G SAMPLES OF KERNELS IN 100 ML DISTILLED WATER. ONE HUNDRED DECILITER QUANTITIES WERE INJECTED DIRECTLY INTO THE YSI MODEL 2700 ANALYZER.

IN ESSENCE, THE SUBSTRATE IN THE SAMPLE IS OXIDIZED VIA THE YSI 2700 ANALYZER BY MEANS OF ONE OR MORE ENZYMES. THE RESULTING INITIAL END PRODUCT IS ULTIMATELY HYDROGEN PEROXIDE THAT IS IN TURN OXIDIZED ELECTROCHEMICALLY BY A PLATINUM ANODE IN THE PROBE.

BY FORMULA THE RECORDED VALUES ARE BACK CALCULATED TO GLUCOSE OR RELATED SUGAR CONCENTRATIONS.

THE BIOCHEMICAL REACTIONS ARE AS FOLLOWS:

REACTION 1 -



REACTION 2 -



**EXHIBIT 16B (REVISED)**SUS
8/21/97

ALL SUGAR ASSAYS WERE PERFORMED WHEN EARS WERE APPROXIMATELY 74-75%~~X~~ MOISTURE.

TO DETERMINE PERICARP LEVELS THE PROCEDURES OUTLINED BY SHANNON (SHANNON, J. 1985. PERSONAL COMMUNICATION. CORNELL UNIVERSITY) WERE UTILIZED.

THE PROCEDURE INVOLVES HOMOGENIZING 100 G OF SWEET CORN KERNELS IN 100 ML OF DISTILLED WATER.

THE RESULTANT HOMOGENATE IS APPLIED TO A #10 MESH SIEVE SCREEN. THE HOMOGENATE IS THEN WASHED REPEATEDLY TO ELIMINATE ALL MATERIALS EXCEPT FOR THE LARGER SIZED PERICARP FRACTION RETAINED BY THE SIEVE SCREEN.

THE PERICARP FRACTION IS DRIED VIA CONVECTION OVEN AT 100 DEGREES CENTIGRADE FOR 24 HOURS UNTIL DRY WEIGHT RESIDUES ARE WEIGHED AND RECORDED.

PERICARP MEASUREMENTS WERE ALSO CONDUCTED WHEN EARS WERE AT APPROXIMATELY 74-75% MOISTURE.

FIGURES 5-7 INDICATE THE INITIALLY HIGH LEVELS OF SUCROSE (THE MAJOR SUGAR COMPONENT IN SWEET CORN) EXHIBITED BY ACX 94 CN06. AFTER TEN DAYS THIS ELEVATED SUCROSE LEVEL IS COMPARABLY WELL MAINTAINED OVER THE OTHER GENETIC TYPES. THE INDICATED HOLDING ABILITIES OF SUCROSE APPEARS TO BE A UNIQUE FEATURE OF ACX 94 CN06 WHEN REFERENCED TO THE HIGH SUGAR INDUSTRY STANDARDS CHALLENGER, FLORIDA STAY SWEET, AND ULTIMATE.

THE EXPRESSION OF REDUCING SUGAR LEVELS (GLUCOSE AND FRUCTOSE) ARE SIMILARLY DEMONSTRATED IN FIGURES 8-13. IN GENERAL, REDUCING SUGAR LEVELS ARE MUCH LOWER OVERALL AS A RULE WHEN ASSOCIATED WITH SUCROSE LEVELS IN SWEET CORN. HOWEVER, ELEVATED LEVELS OF REDUCING SUGARS ARE LARGELY CONSIDERED LINKED TO IMPROVED HOLDING ABILITIES, CREAMY TEXTURES, AND OVERALL PERCEPTIONS OF SWEETNESS.

ONCE AGAIN, ACX 94 CN06 DEMONSTRATED BOTH INITIALLY HIGH LEVELS OF GLUCOSE AND FRUCTOSE WITH RETENTION OF HIGHER CONCENTRATIONS OF BOTH OVER TIME. THIS IS

**EXHIBIT 16B (REVISED)**

ESPECIALLY APPARENT WHEN ACX 94 CN06 IS COMPARED TO THE SE (72Y) AND SUGARY-1 (SILVER QUEEN) STANDARDS.

THESE ELEVATED ANALYTICALLY DETERMINED SUGAR LEVELS ALONG WITH ORGANOLEPTIC TASTE TESTS CLEARLY INDICATED THE UNIQUE AND SUPERIOR EATING QUALITY ATTRIBUTES OF ACX 94 CN06.

ACX 94 CN06 HAS SIGNIFICANTLY ELEVATED SUGAR LEVELS AND HOLDING ABILITIES OF THE SH 2 GENETIC TYPES BUT WITH THE TEXTURE AND OVERALL TASTE BENEFITS OF SE AND SU 1 SWEET CORNS.

PERICARP MEASUREMENTS FOR THE VARIOUS REPRESENTATIVE GENETIC CLASSES ARE SHOWN IN FIGURES 14-16.

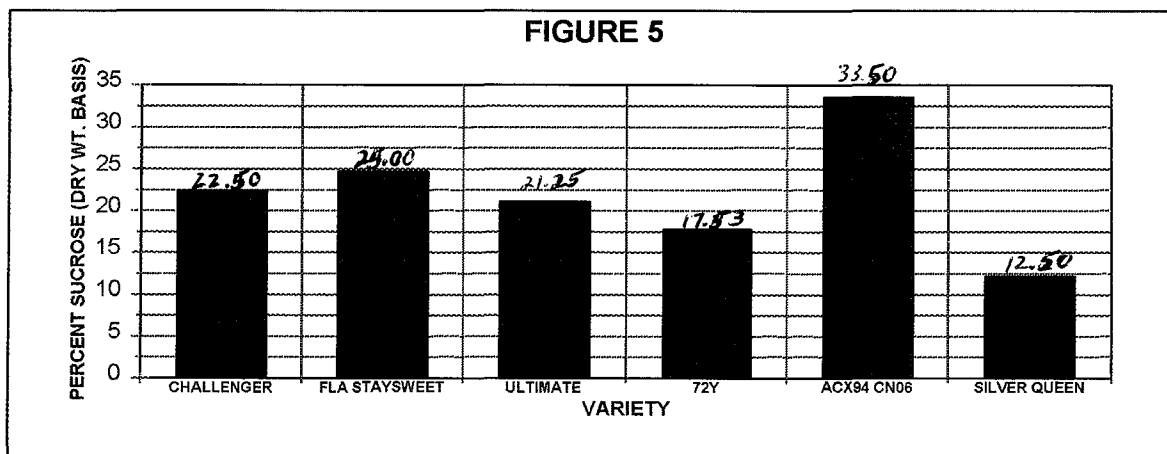
INITIAL (DAY 1) DETERMINATIONS INDICATED TENDER PERICARPS FOR ACX 94 CN06 ALONG WITH 72Y (SE) AND SILVER QUEEN (SU 1). AFTER TEN DAYS ACX 94 CN06 RESULTED IN THE LOWEST CONCENTRATIONS OF PERICARP OF ALL GENETIC TYPES TESTED.

AGAIN THIS DEMONSTRATES THAT ALTHOUGH ACX 94 CN06 EXHIBITS HIGH SUGAR LEVELS ASSOCIATED WITH THE SH 2 CLASS IT MAINTAINS THE TENDER PERICARP CHARACTERISTICS OF THE SE AND SU 1 TYPES.

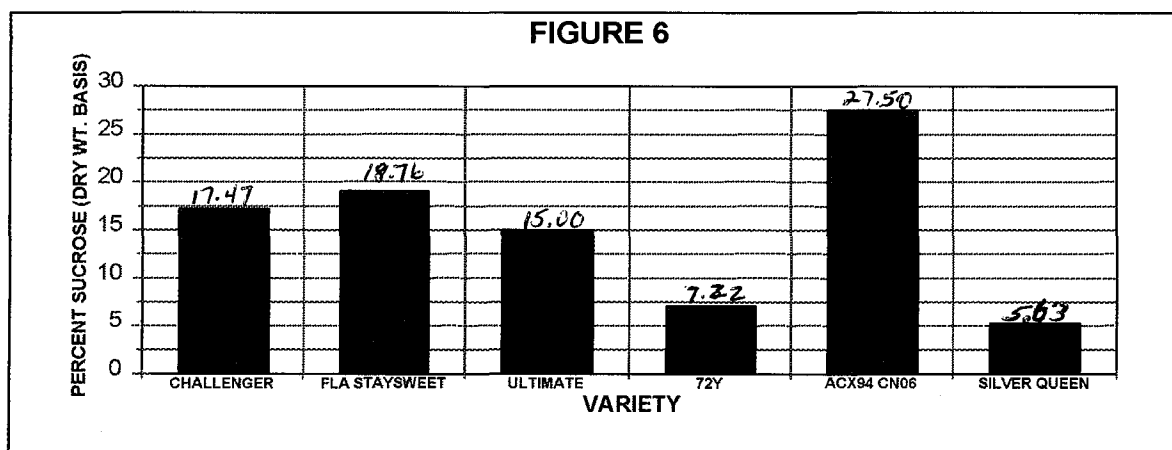
IN GENERAL THESE DATA INDICATE THAT A SERIES OF DESIRABLE ENDOSPERM COMPONENTS ASSOCIATED WITH VARIOUS GENETIC TYPES HAVE BEEN UNIQUELY ASSEMBLED AND STABILIZED INTO ONE.

TO OUR KNOWLEDGE AND EXPERIENCE THIS IS THE FIRST DOCUMENTED EXAMPLE WHEREAS THESE SPECIFIC COMPONENTS (IMPROVED SUGAR LEVELS, TEXTURE, AND FLAVOR) ARE COMBINED AND AVAILABLE IN A SINGLE SWEET CORN VARIETY.

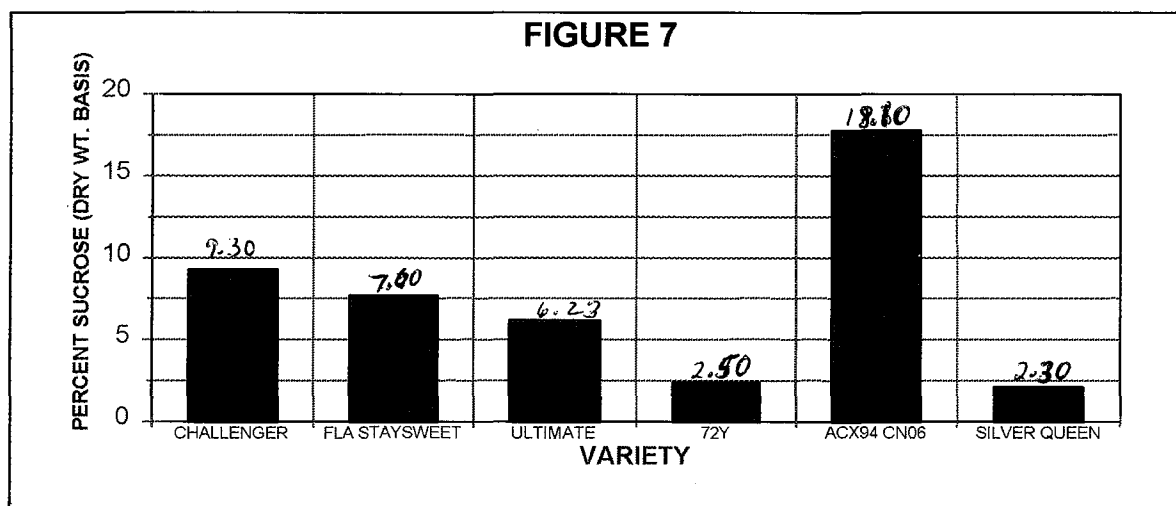
DUE TO THE DRAMATIC DIFFERENCES IN CARBOHYDRATE CHEMISTRIES, (I.E., SUCROSE, GLUCOSE, FRUCTOSE, MALTOSE, ETC.) A MOST SIMILAR VARIETY IS GENETICALLY DISTANT FROM ACX 94 CN06. THEREFORE, ACX 94 CN06 IS THE FIRST VARIETY IN THE CROP CATEGORY WORLDWIDE, WHICH IS ITS MOST UNIQUE AND NOVEL TRAIT.



**PERCENT SUCROSE LEVELS FOR SIX SWEET CORN HYBRIDS
(DAY 1 - ROOM TEMPERATURE)**

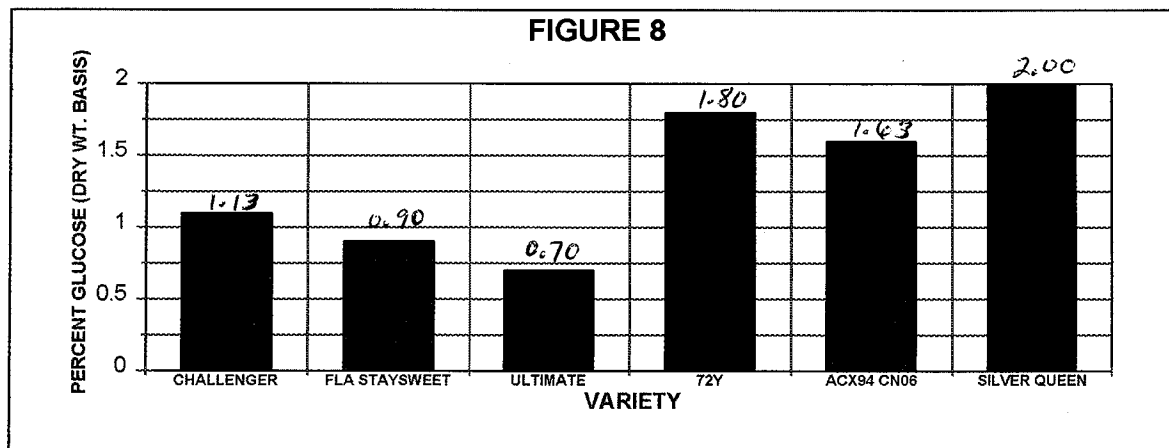


**PERCENT SUCROSE LEVELS FOR SIX SWEET CORN HYBRIDS
(DAY 5 - ROOM TEMPERATURE)**

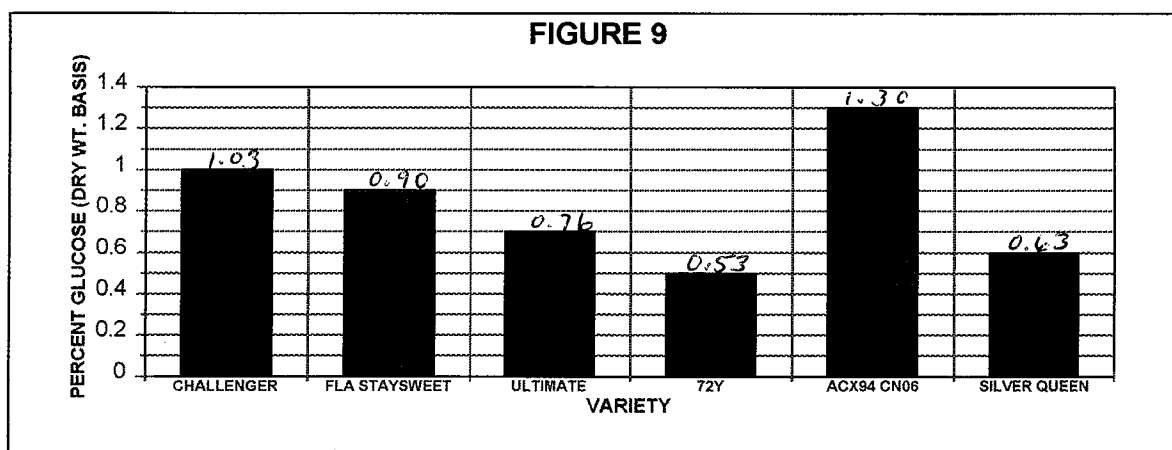


**PERCENT SUCROSE LEVELS FOR SIX SWEET CORN HYBRIDS
(DAY 10 - ROOM TEMPERATURE)**

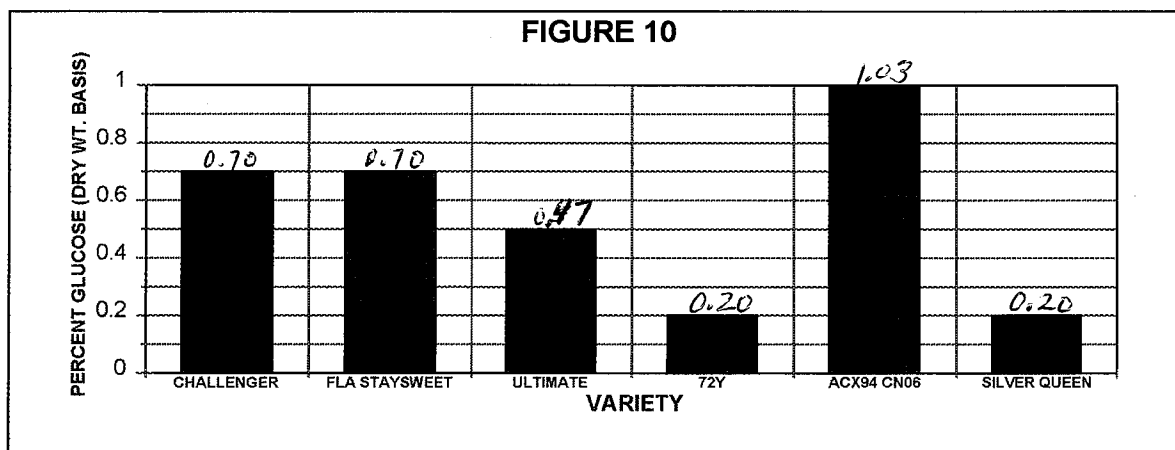
JMS 8/31/97



**PERCENT GLUCOSE LEVELS FOR SIX SWEET CORN HYBRIDS
(DAY 1 - ROOM TEMPERATURE)**

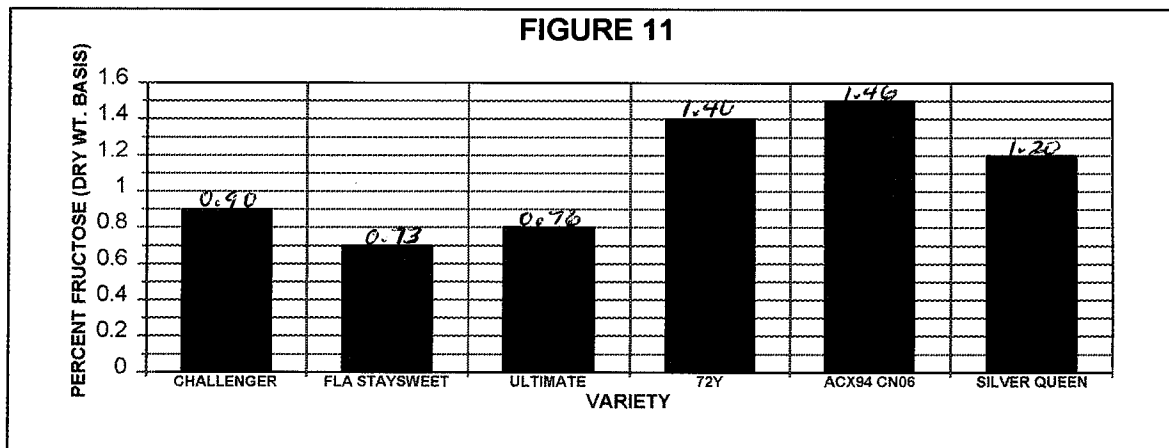


**PERCENT GLUCOSE LEVELS FOR SIX SWEET CORN HYBRIDS
(DAY 5 - ROOM TEMPERATURE)**

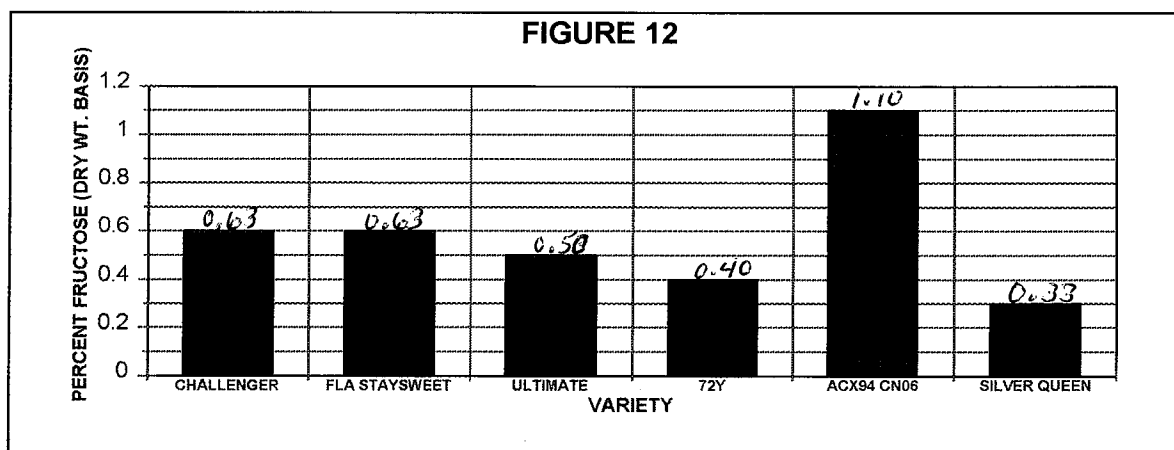


**PERCENT GLUCOSE LEVELS FOR SIX SWEET CORN HYBRIDS
(DAY 10 - ROOM TEMPERATURE)**

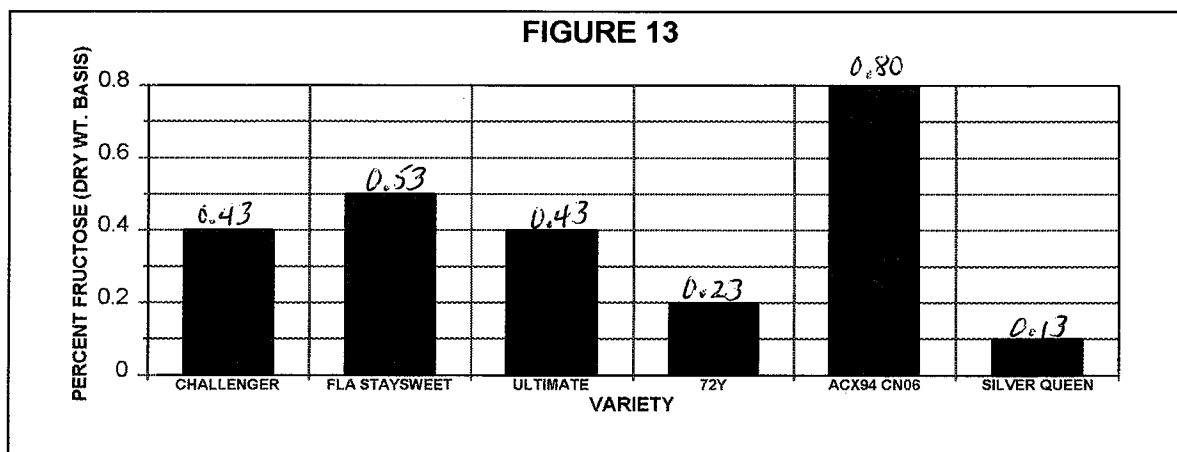
JMS 8/21/97



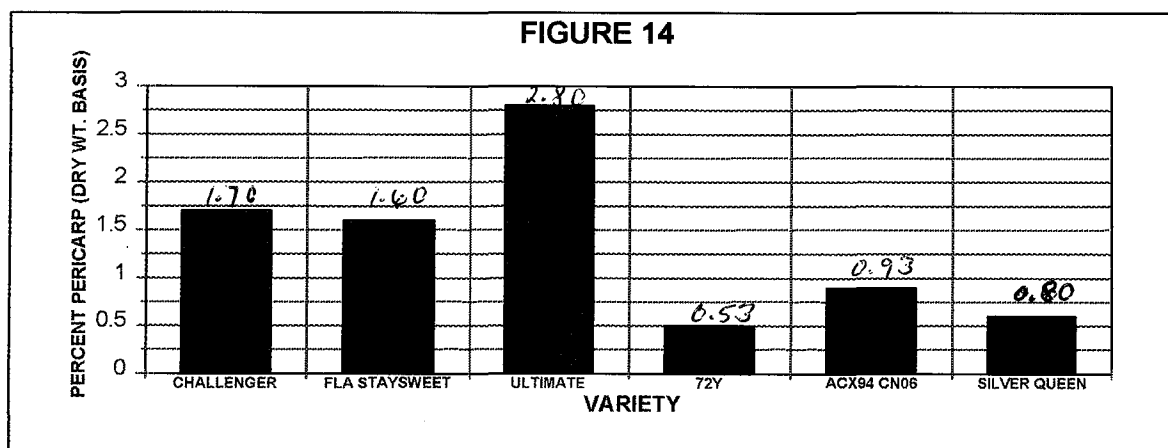
**PERCENT FRUCTOSE LEVELS FOR SIX SWEET CORN HYBRIDS
(DAY 1 - ROOM TEMPERATURE)**



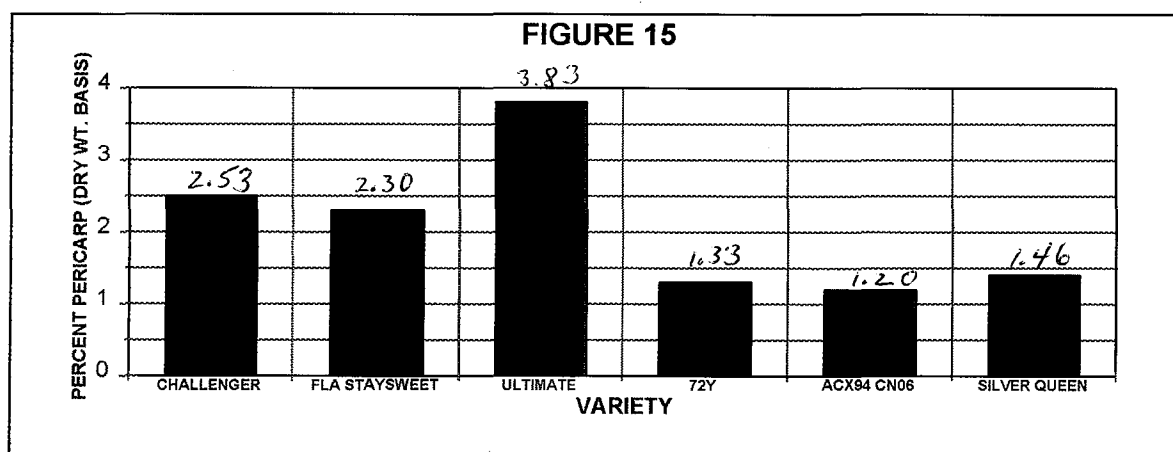
**PERCENT FRUCTOSE LEVELS FOR SIX SWEET CORN HYBRIDS
(DAY 5 - ROOM TEMPERATURE)**



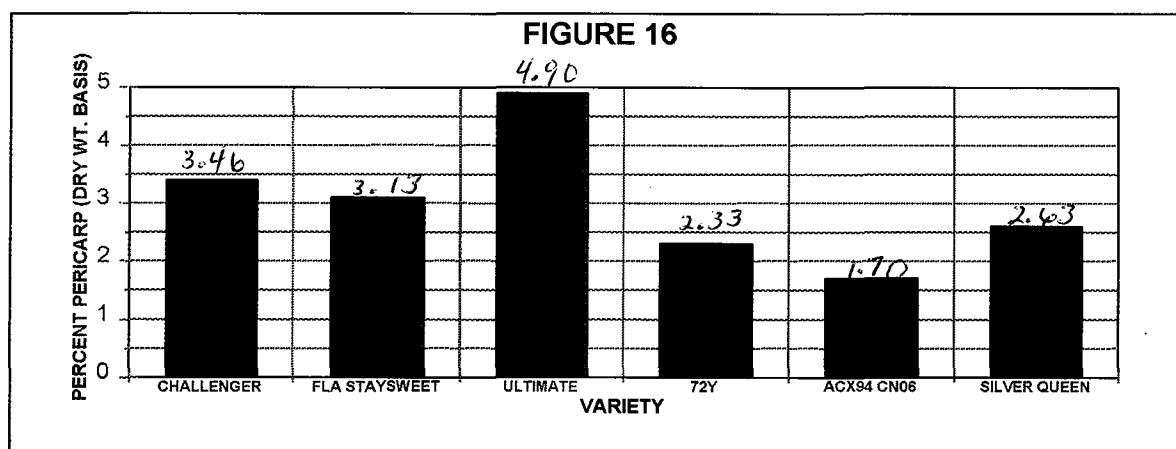
**PERCENT FRUCTOSE LEVELS FOR SIX SWEET CORN HYBRIDS
(DAY 10 - ROOM TEMPERATURE)**



**PERCENT PERICARP LEVELS FOR SIX SWEET CORN HYBRIDS
(DAY 1 - ROOM TEMPERATURE)**



**PERCENT PERICARP LEVELS FOR SIX SWEET CORN HYBRIDS
(DAY 5 - ROOM TEMPERATURE)**



**PERCENT PERICARP LEVELS FOR SIX SWEET CORN HYBRIDS
(DAY 10 - ROOM TEMPERATURE)**

JMS 8/21/97

United States Department of Agriculture, Agricultural Marketing Service
Science Division, Plant Variety Protection Office
National Agricultural Library Building, Room 500
Beltsville, MD 20705

OBJECTIVE DESCRIPTION OF VARIETY
CORN (*Zea mays* L.)

Name of Applicant(s) Abbott & Cobb, Inc.	Variety Seed Source	Variety Name or Temporary Designation #181 Ultra ACX 94 CN 06
Address (Street & No., or R.F.D. No., City, State, Zip Code and Country) P. O. Box 307 Feasterville, PA 19053-0307 U.S.A.		FOR OFFICIAL USE PVPO Number 9600094

Place the appropriate number that describes the varietal characters typical of this inbred variety in the spaces below. Right justify whole numbers by adding leading zeroes if necessary. Completeness should be striven for to establish an adequate variety description. Traits designated by a '*' are considered necessary for an adequate variety description and must be completed.

COLOR CHOICES (Use in conjunction with Munsell color code to describe all color choices; describe #25 and #26 in Comments section):

01=Light Green	06=Pale Yellow	11=Pink	16=Pale Purple	21=Buff
02=Medium Green	07=Yellow	12=Light Red	17=Purple	22=Tan
03=Dark Green	08=Yellow-Orange	13=Cherry Red	18=Colorless	23=Brown
04=Very Dark Green	09=Salmon	14=Red	19=White	24=Bronze
05=Green-Yellow	10=Pink-Orange	15=Red & White	20=White Capped	25=Variegated (Describe)
				26=Other (Describe)

STANDARD INBRED CHOICES (Use the most similar (in background and maturity) of these to make comparisons based on grow-out trial data):

Yellow Dent Families:

Family	Members
B14	CM105, A632, B64, B68
B37	B37, B76, H84
B73	N192, A679, B73, NC268
C103	Mo17, Va102, Va35, A682
Oh43	A619, MS71, H99, Va26
WF9	W64A, A554, A654, Pa91

Yellow Dent (Unrelated):

Co109, ND246,
Oh7, T232
W117, W153R
W182BN

Sweet Corn:

C13, Iowa5125, P39, 2132

Popcorn:

SG1533, 4722, HP301, HP7211

Pipecorn:

Mo15W, Mo16W, Mo24W

White Dent:

CI66, H105, Ky228

1. TYPE: (describe intermediate types in Comments section) * <u>1</u> 1=Sweet 2=Dent 3=Flint 4=Flour 5=Pop 6=Ornamental 7=Popcorn (See Comments)			Standard Inbred ^{Hybrid} Name <u>Silver Queen</u>		
2. REGION WHERE DEVELOPED IN THE U.S.A.: * <u>4</u> 1=Northwest 2=Northcentral 3=Northeast 4=Southeast 5=Southcentral 6=Southwest 7=Other (See Comments)			Standard Seed Source <u>1</u>		
3. MATURITY (In Region Best Adaptability; show Heat Unit formula in "Comments" section):			DAYS HEAT UNITS		
* <u>61</u> <u>1 3 7 0</u> From emergence to 50% of plants in silk			<u>0 6 8</u> <u>1 5 3 4</u>		
* <u>59</u> <u>1 3 4 2</u> From emergence to 50% of plants in pollen			<u>0 6 6</u> <u>1 4 7 7</u>		
<u>2</u> <u>0 0 4 6</u> From 10% to 90% pollen shed			<u>0 0 2</u> <u>0 0 4 5</u>		
(*) <u>20</u> <u>0 4 9 3</u> From 50% silk to optimum edible quality			<u>0 2 0</u> <u>0 4 8 7</u>		
<u>69</u> <u>1 2 4 2</u> From 50% silk to harvest at 25% moisture			<u>0 6 7</u> <u>1 2 0 1</u>		
4. PLANT:	Standard Deviation	Sample Size	Standard Deviation	Sample Size	
* <u>198</u> <u>.1</u> cm Plant Height (to tassel tip)	<u>25.52</u>	<u>25</u>	<u>2 0 8.3</u>	<u>16.33</u>	<u>25</u>
* <u>66</u> <u>.1</u> cm Ear Height (to base of top ear node)	<u>20.41</u>	<u>25</u>	<u>0 7 5.4</u>	<u>9.88</u>	<u>25</u>
<u>27</u> <u>.9</u> cm Length of Top Ear Internode	<u>7.65</u>	<u>25</u>	<u>0 2 9.8</u>	<u>6.81</u>	<u>25</u>
<u>2</u> <u>.3</u> Average Number of Tillers	<u>0.92</u>	<u>25</u>	<u>0 0 2.6</u>	<u>0.67</u>	<u>25</u>
* <u>1</u> <u>.1</u> Average Number of Ears per Stalk	<u>0.32</u>	<u>25</u>	<u>0 0 1.2</u>	<u>0.34</u>	<u>25</u>
<u>1</u> Anthocyanin of Brace Roots: 1=Absent 2=Faint 3=Moderate 4=Dark			<u>3</u>		
Application Variety Data			Standard Inbred ^{Hybrid} Data		

Application Variety Data			Standard Inbred Data		
Page 2			hybrid		
5. LEAF:			Standard Deviation Sample Size		
* <u> </u> <u>9.5</u> cm Width of Ear Node Leaf	<u>3.11</u>	<u>25</u>	<u>009.8</u>	<u>2.37</u>	<u>25</u>
* <u> </u> <u>6.1</u> cm Length of Ear Node Leaf	<u>17.30</u>	<u>25</u>	<u>068.4</u>	<u>14.11</u>	<u>25</u>
* <u> </u> <u>9.0</u> Number of leaves above top ear	<u>1.73</u>	<u>25</u>	<u>10</u>	<u>0.87</u>	<u>25</u>
<u>40.3</u> degrees Leaf Angle (measure from 2nd leaf above ear at anthesis to stalk above leaf)	<u>12.24</u>	<u>25</u>	<u>046.2</u>	<u>11.11</u>	<u>25</u>
* <u> </u> <u>02</u> Leaf Color (Munsell code <u>7.5 GY (5/4 to 5/6)</u>)			<u>02</u>	(Munsell code <u>7.5 GY 5/6-5/8</u>)	
<u> </u> <u>2</u> Leaf Sheath Pubescence (Rate on scale from 1=none to 9=like peach fuzz)			<u>3</u>		
<u> </u> <u>2</u> Marginal Waves (Rate on scale from 1=none to 9=many)			<u>3</u>		
<u> </u> <u>2</u> Longitudinal Creases (Rate on scale from 1=none to 9=many)			<u>2</u>		
6. TASSEL:			Standard Deviation Sample Size		
* <u> </u> <u>14</u> Number of Primary Lateral Branches	<u>3.62</u>	<u>25</u>	<u>12</u>	<u>2.61</u>	<u>25</u>
<u> </u> <u>0.4</u> Branch Angle from Central Spike	<u>12.24</u>	<u>25</u>	<u>053.8</u>	<u>12.83</u>	<u>25</u>
* <u> </u> <u>6.7</u> cm Tassel Length (from top leaf collar to tassel tip)	<u>9.33</u>	<u>25</u>	<u>28.4</u>	<u>5.44</u>	<u>25</u>
<u> </u> <u>8</u> Pollen Shed (Rate on scale from 0=male sterile to 9=heavy shed)			<u>6</u>		
<u> </u> <u>6</u> Anther Color (Munsell code <u>5Y (8/6 to 8/8)</u>)			<u>05</u>	(Munsell code <u>5Y 8/8-8/10</u>)	
<u> </u> <u>1</u> Glume Color (Munsell code <u>2.5 GY (8/6 to 8/8)</u>)			<u>02</u>	(Munsell code <u>2.5 GY 7/6-7/8</u>)	
<u> </u> <u>1</u> Bar Glumes (Glume Bands): 1=Absent 2=Present			<u>1</u>		
7a. EAR (Unhusked Data):			Standard Deviation Sample Size		
* <u> </u> <u>19</u> Silk Color (3 days after emergence) (Munsell code <u>2.5 GY 8/2 to 8/4</u>)			<u>19</u>	(Munsell code <u>2.5 GY 8/2-8/4</u>)	
<u> </u> <u>03</u> Fresh Husk Color (25 days after 50% silking) (Munsell code <u>7.5 GY (5/6)</u>)			<u>03</u>	(Munsell code <u>7.5 GY 5/8</u>)	
<u> </u> <u>22</u> Dry Husk Color (65 days after 50% Silking) (Munsell code <u>2.5 Y (6/4 to 6/6)</u>)			<u>22</u>	(Munsell code <u>2.5 Y 5/2-5/4</u>)	
* <u> </u> <u>1</u> Position of Ear at Dry Husk Stage: 1=Upright 2=Horizontal 3=Pendent			<u>1</u>		
<u> </u> <u>7</u> Husk Tightness (Rate on scale from 1=very loose to 9=very tight)			<u>8</u>		
<u> </u> <u>2</u> Husk Extension (at harvest): 1=Short (ears exposed) 2=Medium (<8 cm) 3=Long (8-10 cm beyond ear tip) 4=Very Long (>10 cm)			<u>3</u>		
7b. EAR (Husked Ear Data):			Standard Deviation Sample Size		
* <u> </u> <u>16.5</u> cm Ear Length	<u>3.75</u>	<u>25</u>	<u>18.8</u>	<u>3.10</u>	<u>25</u>
* <u> </u> <u>48.8</u> mm Ear Diameter at mid-point	<u>2.86</u>	<u>25</u>	<u>40.6</u>	<u>1.21</u>	<u>25</u>
<u> </u> <u>85.1</u> gm Ear Weight	<u>10.93</u>	<u>25</u>	<u>081.2</u>	<u>9.63</u>	<u>25</u>
* <u> </u> <u>16</u> Number of Kernel Rows	<u>3.71</u>	<u>25</u>	<u>16</u>	<u>2.11</u>	<u>25</u>
<u> </u> <u>2</u> Kernel Rows: 1=Indistinct 2=Distinct			<u>2</u>		
<u> </u> <u>1</u> Row Alignment: 1=Straight 2=Slightly Curved 3=Spiral			<u>1</u>		
<u> </u> <u>5.7</u> cm Shank Length	<u>1.12</u>	<u>25</u>	<u>05.4</u>	<u>1.37</u>	<u>25</u>
<u> </u> <u>1</u> Ear Taper: 1=Slight 2=Average 3=Extreme			<u>1</u>		
Application Variety Data			Standard Inbred Data		
Note: Use chart on first page to choose color codes for color traits.			hybrid		

Application Variety Data			Standard Inbred Data		
8. KERNEL (Dried):			Standard Deviation Sample Size		
1 0.0 mm Kernel Length	2.37	25	09.1	2.31	25
8.2 mm Kernel Width	1.80	25	07.7	1.01	25
6.4 mm Kernel Thickness	1.11	25	05.6	0.90	25
2 7.1 % Round Kernels (Shape Grade)	2.25	25	24.0	2.63	25
1 Aleurone Color Pattern: 1=Homozygous 2=Segregating			1		
(*) 1 8 Aleurone Color (Munsell code <u>5Y 8/4-8/6</u> ^{DRY} <u>5Y 8/2-8/4</u> ^{Fresh})			1 8 (Munsell code <u>5Y 8/4</u> ^{DRY} <u>5Y 8/2</u> ^{Fresh})		
* 10.6 Hard Endosperm Color (Munsell code <u>2.5Y 8/4</u> <u>2.5Y 8/2</u>)			0 6 (Munsell code <u>5Y 8/4</u> <u>2.5Y 8/2</u>)		
* 8 Endosperm Type: 1=Sweet (su1) 2=Extra Sweet (sh2) 3=Normal Starch 4=High Amylose Starch 5=Waxy Starch 6=High Protein 7=High Lysine 8=Super Sweet (se) 9=High Oil 10=Other			1		
1 2.3 gm Weight per 100 Kernels (unsized sample)	2.13	25	16.9	1.61	25
9. COB:			Standard Deviation Sample Size		
* 3 6.3 mm Cob Diameter at mid-point	7.9	25	31.1	6.40	25
1 9 Cob Color (Munsell code <u>- 2.5Y 8/2</u>)			1 9 (Munsell code <u>2.5Y 8/4</u>)		
10. DISEASE RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant); leave blank if not tested; leave Race or Strain Options blank if polygenic):					
A. Leaf Blights, Wilts, and Local Infection Diseases					
<u>2</u> Anthracnose Leaf Blight (<i>Colletotrichum graminicola</i>) <u>5</u> Common Rust (<i>Puccinia sorghi</i>) <u>5</u> Common Smut (<i>Ustilago maydis</i>) Eyespot (<i>Kabatella zeae</i>) Goss's Wilt (<i>Clavibacter michiganense</i> spp. <i>nebraskense</i>) Gray Leaf Spot (<i>Cercospora zeae-maydis</i>) Helminthosporium Leaf Spot (<i>Bipolaris zeicola</i>) Race _____ <u>6</u> Northern Leaf Blight (<i>Exserohilum turcicum</i>) Race <u>1</u> and <u>2</u> <u>8</u> Southern Leaf Blight (<i>Bipolaris maydis</i>) Race <u>T</u> Southern Rust (<i>Puccinia polysora</i>) <u>7</u> Stewart's Wilt (<i>Erwinia stewartii</i>) Other (Specify) _____					
B. Systemic Diseases					
Corn Lethal Necrosis (MCMV and MDMV) <u>5</u> Head Smut (<i>Sphacelotheca reiliana</i>) Maize Chlorotic Dwarf Virus (MCDV) Maize Chlorotic Mottle Virus (MCMV) <u>4</u> Maize Dwarf Mosaic Virus (MDMV) Strain <u>A and B</u> Sorghum Downy Mildew of Corn (<i>Peronosclerospora sorghi</i>) Other (Specify) _____					
C. Stalk Rots					
Anthracnose Stalk Rot (<i>Colletotrichum graminicola</i>) Diplodia Stalk Rot (<i>Stenocarpella maydis</i>) Fusarium Stalk Rot (<i>Fusarium moniliforme</i>) Gibberella Stalk Rot (<i>Gibberella zeae</i>) Other (Specify) _____					
D. Ear and Kernel Rots					
<u>6</u> Aspergillus Ear and Kernel Rot (<i>Aspergillus flavus</i>) Diplodia Ear Rot (<i>Stenocarpella maydis</i>) <u>6</u> Fusarium Ear and Kernel Rot (<i>Fusarium moniliforme</i>) Gibberella Ear Rot (<i>Gibberella zeae</i>) Other (Specify) _____					

5MS 8/21/97

Application Variety Data	Page 4	Standard Inbred Data
11. INSECT RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant); leave blank if not tested):		
— Banks Grass Mite (<i>Oligonychus pratensis</i>)	Standard Deviation	Sample Size
— Corn Earworm (<i>Helicoverpa zea</i>)		
— Leaf-Feeding		
— Silk Feeding :		
— mg larval wt.		
— Ear Damage		
5 Corn Leaf Aphid (<i>Rhopalosiphum maidis</i>)		4
5 Corn Sap Beetle (<i>Carpophilus dimidiatus</i>)		6
— European Corn Borer (<i>Ostrinia nubilalis</i>)		
— 1st Generation (Typically Whorl Leaf Feeding)		
— 2nd Generation (Typically Leaf Sheath-Collar Feeding)		
— Stalk Tunneling :		
— cm tunneled/plant		
— Fall Armyworm (<i>Spodoptera frugiperda</i>)		
— Leaf-Feeding		
— Silk-Feeding :		
— mg larval wt.		
— Maize Weevil (<i>Sitophilus zeamais</i>)		
— Northern Rootworm (<i>Diabrotica barberi</i>)		
— Southern Rootworm (<i>Diabrotica undecimpunctata</i>)		
— Southwestern Corn Borer (<i>Diatraea grandiosella</i>)		
— Leaf Feeding		
— Stalk Tunneling :		
— cm tunneled/plant		
— Two-spotted Spider Mite (<i>Tetranychus urticae</i>)		
— Western Rootworm (<i>Diabrotica virgifera virgifera</i>)		
— Other (Specify)		

12. AGRONOMIC TRAITS:		
3 Stay Green (at 65 days after anthesis) (Rate on a scale from 1=worst to 9=excellent.)		2
1 4.0 % Dropped Ears (at 65 days after anthesis)		23.7
1.0 % Pre-anthesis Brittle Snapping		01.0
3.5 % Pre-anthesis Root Lodging		11.5
1 1.5 % Post-anthesis Root Lodging (at 65 days after anthesis)		31.2
— Kg/ha Yield of Inbred Per Se (at 12-13% grain moisture) (See Comments)		

13. MOLECULAR MARKERS: (0=data unavailable; 1=data available but not supplied; 2=data supplied)	
0 Isozymes	0 RFLP's
0 RAPD's	

REFERENCES:

Butler, D.R. 1954. A System for the Classification of Corn Inbred Lines. PhD Thesis, Ohio State University.

Emerson, R.A., G.W. Beadle, and A.C. Fraser. 1935. A Summary of Linkage Studies in Maize. Cornell A.E.S., Mem. 180.

Farr, D.F., G.F. Bills, G.P. Chamuris, A.Y. Rossman. 1989. Fungi on Plant and Plant Products in the United States. The American Phytopathological Society, St. Paul, MN.

Inglett, G.E. (Ed.) 1970. Corn: Culture, Processing, Products. Avi Publishing Company, Westport, CT.

Jugenheimer, R.W. 1976. Corn: Improvement, Seed Production, and Uses. John Wiley & Sons, New York.

McGee, D.C. 1988. Maize Diseases. APS Press, St. Paul, MN. 150 pp.

Munsell Color Chart for Plant Tissues. Macbeth. P.O. Box 230, Newburgh, N.Y. 12551-0230

The Mutants of Maize. 1968. Crop Science Society of America, Madison, WI.

Shurtleff, M.C. 1980. Compendium of Corn Diseases. APS Press, St. Paul, MN. 105 pp.

Sprague, G.F., and J.W. Dudley (Editors). 1988. Corn and Corn Improvement, Third Edition. Agronomy Monograph 18. ASA, CSSA, SSSA, Madison, WI.

Stringfield, G.H. Maize Inbred Lines of Ohio. Ohio A.E.S., Bul. 831. 1959.

U.S. Department of Agriculture. 1936, 1937. Yearbook.

COMMENTS (eg. state how heat units were calculated, standard inbred seed source, and/or where data was collected. Continue in Exhibit D):

(1) Type: The hybrid is considered in the sweet corn class and is a combination of su₁ (sugary) se (sugary enhancer), and sh₂ (shrunken ²) genetic types.

(2) Data collected from the Belle Glade, Florida area. Designated seed source is lot number 64540.

(12) ACX94 CN06 averages approximately 350 crates/acre whereas one crate holds an average of 48 ears at 75% moisture.

**SUPPLEMENTARY EXHIBIT C
EXPLANATION OF LARGER STANDARD DEVIATIONS**

THE LARGER THAN NORMAL STANDARD DEVIATIONS REGARDING SOME TRAITS OF "781" ARE THE DIRECT RESULT OF THE FOLLOWING SIGNIFICANT ENVIRONMENTAL AND CULTURAL FACTORS:

(A) GROWOUTS PERFORMED IN SUBSTANTIALLY DIFFERENT GEOGRAPHICAL LOCATIONS:

LOCATION	LATITUDE
FLORIDA	26 DEGREES NORTH
GEORGIA	31 DEGREES NORTH
PENNSYLVANIA	40 DEGREES NORTH
IDAHO	44 DEGREES NORTH
CALIFORNIA	38 DEGREES NORTH
MEXICO	24 DEGREES NORTH

(B) DAY/NIGHT TEMPERATURE RANGES PER GEOGRAPHICAL LOCATION

LOCATION	TEMPERATURE RANGE (DAY/NIGHT)
FLORIDA	+/- 25 DEGREES
GEORGIA	+/- 25 DEGREES
PENNSYLVANIA	+/- 20 DEGREES
IDAHO	+/- 35 DEGREES
CALIFORNIA	+/- 35 DEGREES
MEXICO	+/- 25 DEGREES

(C) SOIL TYPES

LOCATION	SOIL TYPE
FLORIDA	MUCK, SAND, ROCK
GEORGIA	SAND, LOAM
PENNSYLVANIA	LOAM, CLAY
IDAHO	LOAM
CALIFORNIA	LOAM
MEXICO	SAND, LOAM

(D) WATER REGIME

LOCATION	IRRIGATION METHOD
FLORIDA	NATURAL, OVERHEAD
GEORGIA	NATURAL, OVERHEAD
PENNSYLVANIA	NATURAL
IDAHO	FURROW
CALIFORNIA	FURROW
MEXICO	NATURAL, OVERHEAD, FURROW

(E) CULTURAL PRACTICES (SEED BED PREPARATION)

LOCATION	SOIL PREPARATION
FLORIDA	TRENCHED, PLASTIC MULCH
GEORGIA	TRECHED
PENNSYLVANIA	LEVEL
IDAHO	FURROW
CALIFORNIA	FURROW
MEXICO	LEVEL

(F) FERTILIZER APPLICATION (EXAMPLE - NITROGEN QUANTITIES)

LOCATION	NITROGEN APPLICATION RANGE/ACRE
FLORIDA	100 - 500 POUNDS
GEORGIA	100 - 300 POUNDS
PENNSLYVANIA	100 - 150 POUNDS
IDAHO	100 - 150 POUNDS
CALIFORNIA	100 - 200 POUNDS
MEXICO	100 - 200 POUNDS

(G) HERBICIDE APPLICATION

LOCATION	HERBICIDE APPLIED
FLORIDA	LASSO
GEORGIA	ATRIZINE/LASSO
PENNSYLVANIA	NONE
IDAHO	LASSO
CALIFORNIA	NONE - LASSO
MEXICO	NONE - LASSO

(H) DAYLENGTH VARIATIONS

LOCATION	DAYLENGTH CLASSIFICATION
FLORIDA	SHORTDAY
GEORGIA	INTERMEDIATE/SHORTDAY
PENNSYLVANIA	LONGDAY
IDAHO	LONGDAY
CALIFORNIA	INTERMEDIATE/LONGDAY
MEXICO	SHORTDAY

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

1. NAME OF APPLICANT(S) Abbott & Cobb, Inc.	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER ACX 94 CN 06	3. VARIETY NAME #781 <i>Ultra</i> JM 2/1
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) 4151 Street Road P.O. Box 307 Feasterville, PA 19053-0307	5. TELEPHONE (include area code) 215-245-6666	6. FAX (include area code) 215-245-1068
7. PVPO NUMBER 9600094		
8. Does the applicant own all rights to the variety? Mark an "X" in appropriate block. If no, please explain. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		
9. Is the applicant (individual or company) a U.S. national or U.S. based company? If no, give name of country <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		
10. Is the applicant the original owner? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO If no, please answer the following: a. If original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. national(s)? <input type="checkbox"/> YES <input type="checkbox"/> NO If no, give name of country _____ b. If original rights to variety were owned by a company, is the original owner(s) a U.S. based company? <input type="checkbox"/> YES <input type="checkbox"/> NO If no, give name of country _____		
11. Additional explanation on ownership (If needed, use reverse for extra space):		

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 10 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, and marital or familial status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (braille, large print, audiotope, etc.) should contact the USDA Office of Communications at (202) 720-5881 (voice) or (202) 720-7808 (TDD).

To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, D.C. 20250, or call 1-800-245-6340 (voice) or (202) 720-1127 (TDD). USDA is an equal employment opportunity employer.



EXHIBIT 16E (REVISED)

STATEMENT OF OWNERSHIP OF THE VARIETY

The variety ACX 94CN06 and the inbred parents used to create this hybrid are owned entirely by Abbott & Cobb, Inc. ACX 94 CN06 and the inbred parents have been developed in their entirety under the corporation's direction and expense.

All breeding work was done by Abbott & Cobb, Inc. personnel at its facilities in Feasterville, PA, Nampa, ID, and West Palm Beach, FL. At no time was the inbred or hybrid materials exposed to any public environment. Abbott & Cobb, Inc. claims 100% ownership in the specific inbreds used to create hybrid ACX 94 CN06, which were the result of its own work product, and claims it as intellectual property under guidelines prescribed by United States statutes.

The plant breeder of this variety is Dr. Bryant J. Long, Phd, who is Vice President of Product Development for the corporation.